

REMARKS/ARGUMENTS

Claim 62 is rejected as being incorrectly dependent from Claim 59. It has been amended to depend from Claim 61.

Claims 50, 51, 53, 55 and 56 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Dasgupta, et al. ('204) in view of Sorensen, et al. The examiner concedes that the Dasgupta fails to teach or suggest a barrier thickness in Claim 50 and 55 that states that Sorensen teaches a barrier with a thickness of 0.01 to 2.0 mm. However there is no suggestion in Sorensen to use a thick membrane for any purpose remotely related to the apparatus or method for generating an acid or base as set forth in the present claims. Thus, there is no reason suggested in the prior art to use a thick membrane in the method of the present invention. In particular, it would not be obvious to use a thick membrane to provide maximum ion exchange sites to speed ion transporter across the barrier. To the contrary, it would be expected that the speed would be reduced for the ions to transport the longer distance across the thicker membrane.

The reason for the thicker membrane is discussed in an amendment dated December 17, 1999 in the parent application which issued into U.S. Patent No. 6,225,129, copy enclosed as Exhibit A for the convenience of the examiner. Referring to pages 11 and 12 of that amendment, the preferred membrane thickness in the ones used in the examples of Dasgupta are between 0.05 and 0.1 mm in thickness with the maximum disclosed thickness of 0.25 mm, 25% of the minimum thickness set forth in Claims 50 and 55. As set forth in the Declaration accompanying Exhibit A, a thickness as low as 0.86 mm can leak at pressures as low as 1000 psi. The specification discloses the use of thicknesses in excess of 1 mm to withstand pressures on the order of 1000-3000 psi. There would be no reason to use such thick membranes to withstand high pressure in Dasgupta because the pump is disposed on the downstream side of the acid or base generator. Thus, there is a minimum of pressure in the acid or base generator of Dasgupta, less than 100 psi, and so there would be no reason in the Dasgupta system to use a thick membrane with its incumbent higher cost for a low pressure system such as that of Dasgupta. Thus, it is submitted that the use of such a thick membrane in an acid or base generator of the type set forth in the present claims is neither disclosed nor suggested by Dasgupta, alone or in combination with Sorensen.

Dependent Claims 52 and 57 were stated by the examiner to be allowable if rewritten in independent form. New Claim 66 and 67 are Claims 52 and 57, respectively, rewritten in independent form. Thus, it is submitted that Claims 66 and 67 are free of the prior art and allowable.

Claims 59, 61-63 and 65 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Dasgupta. Referring to Claims 59 and 63, the examiner concedes that Dasgupta does not disclose a pump upstream of the generator chamber but states that it would be obvious to so dispose the pump. To the contrary, as illustrated in Exhibit A, pages 12 and 13, in the claimed system, an aqueous stream flows through the acid or base generator and then through the chromatography column or pump by a single upstream pump. There are significant advantages to this set up. Firstly, water, rather than generated acid or base, can flow through an upstream pump, thus the lifetime of the pump is improved in comparison to a pump which must pass corrosive acid or base. This advantage is not apparent from Dasgupta because the pump in Dasgupta would be exposed to corrosive acid or base whether it is upstream or downstream of the cell. Secondly, a pump has dead volume which can create error particularly for the use of gradient eluents. This source of error is limited by the methods of Claims 59 and 63 as set forth in the Declaration accompanying Exhibit A because the pump is upstream of the eluent generator. Thus, significant advantages are provided by disposing the pump on the upstream side of the eluent generator which is neither disclosed nor suggested in Dasgupta.

The Examiner states that Claims 60 and 64, dependent on Claims 59 and 63, would be allowable if rewritten into independent form. New claims 70 and 71 are Claims 60 and 64 rewritten into independent form. Therefore it is submitted that new claims 70 and 71 are free of the prior art and now allowable.

Claims 54 and 58 were stated to be allowable if rewritten into independent form. Claims 54 and 58 have been amended to independent form and are thus now deemed allowable.

New Claim 68 and 69 recite that the first acid or base generator chamber is pressurized and that the pressure maintained in the first acid or base generator chambers at least two times the pressure maintained in an ion source reservoir. This pressure differential is neither disclosed nor suggested by Dasgupta which disclosed the same pressure on both sides of the membrane. Some of the advantages of pressure differential are illustrated at pages 9 and 10 of Exhibit A. The pressure differential permits the use of a high pressure chromatographic pump for the aqueous liquid stream flowing through the acid or base generator chamber on the upstream side of it within the source

reservoir which can be maintained at atmospheric pressure. In Dasgupta, the pump is disclosed to be downstream of the generator requiring a second pump for the source solution. No pressure differential is suggested by Dasgupta. As further set forth in Exhibit A, if the thin membrane as disclosed in Dasgupta were used with high pressure in the acid or base generator, this could lead to rupture and leakage of the disclosed thin membrane. Thus, the use of the claimed pressure differential is neither disclosed or suggested by Dasgupta and has substantial advantages. Therefore, it is submitted that this claim further distinguishes from the prior art.

The foregoing amendments were made in order to expedite allowance.

In view of the foregoing, it is submitted that all claims are in condition for allowance. A favorable action is solicited. If the Examiner has any questions, she is invited to call the undersigned attorney at (415) 781-1989.

The Commissioner is authorized to charge any additional fees which may be required, including extension fees, or credit any overpayment to Deposit Account No. 50-2319 (Our Docket A-65351-2; Our File 465377-708/DJB).

Respectfully submitted,
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